CTEH® CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

# Mission Incident
# Santa Paula, CA
# Preliminary Summary of Air Monitoring Results
# November 25, 2014

Prepared by
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CTEH® CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

## Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vac truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for November 25, 2014 07:00 to November 26, 2014 07:00.

## Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for chlorine ($Cl_2$), hydrogen sulfide ($H_2S$), percent of the Lower Explosive Limit (LEL), oxygen ($O_2$), peroxides, sulfur dioxide ($SO_2$), sulfuric acid ($H_2SO_4$), particulate matter (10-micron particles, $PM_{10}$), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems© AreaRAE units with ProRAE Guardian system at four locations on the fence line of the facility within the work area. AreaRAEs were equipped with sensors to detect VOCs, LEL, $H_2S$, and $SO_2$. Table 2 summarizes monitoring data for AreaRAE monitoring. The LEL detections reported at AreaRAE Unit 02 were identified as confirmed sensor drift by CTEH® personnel using a secondary instrument. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Additional particulate monitoring was conducted around the facility perimeter within the Work Area. TSI AM510 SidePak aerosol monitors equipped with 10-micron impactors were collocated with the AreaRAE units. Table 3 summarizes monitoring data for data-logged AM510 units.

Table 1: Manually-Logged Real-Time Air Monitoring Summary[1]
November 25, 2014 07:00 – November 26, 2014 07:00

| Location Category | Analyte | Instrument | No. of Readings | No. of Detections | Avg. of Detections | Concentration Range |
|---|---|---|---|---|---|---|
| Community | $Cl_2$ | MR+ | 10 | 0 | NA | <0.1 ppm |
| | | Gastec 8La | 3 | 0 | NA | < 0.05 ppm |
| | CO | MR+ / MR Pro | 13 | 0 | NA | <1 ppm |
| | $H_2S$ | MR+ / MR Pro | 13 | 0 | NA | <0.1 ppm |
| | LEL | MR+ / MR Pro | 13 | 0 | NA | <1 % |
| | $O_2$ | MR+ / MR Pro | 13 | 13 | 20.9 | 20.9 - 20.9 % |
| | Peroxides | Gastec 32 | 14 | 0 | NA | <0.1 ppm |

| | | | | | | |
|---|---|---|---|---|---|---|
| | $PM_{10}$ | AM510/Dusttrak | 13 | 13 | 0.008 | 0.001 - 0.019 $mg/m^3$ |
| | $SO_2$ | MR+ | 13 | 0 | NA | <0.1 ppm |
| | $H_2SO_4$ | Gastec 35 | 13 | 0 | NA | <0.2 $mg/m^3$ |
| | VOC | MR+ / MR Pro | 13 | 0 | NA | <0.1 ppm |
| Exclusion Zone | $Cl_2$ | MR+ | 2 | 0 | NA | <0.1 ppm |
| | $H_2S$ | MR+ / MR Pro | 2 | 0 | NA | <0.1 ppm |
| | LEL | MR+ / MR Pro | 5 | 0 | NA | <1 % |
| | $O_2$ | MR+ / MR Pro | 2 | 2 | 20.9 | 20.9 - 20.9 % |
| | $SO_2$ | MR+ | 3 | 0 | NA | <0.1 ppm |
| | VOC | MR+ / MR Pro | 5 | 0 | NA | <0.1 ppm |
| Work Area | $Cl_2$ | MR+ | 17 | 0 | NA | <0.1 ppm |
| | $H_2S$ | MR+ / MR Pro | 15 | 0 | NA | <0.1 ppm |
| | LEL | MR+ / MR Pro | 6 | 0 | NA | <1 % |
| | O2 | MR+ / MR Pro | 6 | 6 | 20.9 | 20.9 - 20.9 % |
| | Peroxides | Gastec 32 | 1 | 0 | NA | <0.1 ppm |
| | $PM_{10}$ | AM510/Dusttrak | 16 | 16 | 0.014 | 0.009 - 0.025 $mg/m^3$ |
| | $SO_2$ | MR+ | 5 | 0 | NA | <0.1 ppm |
| | $H_2SO_4$ | Gastec 35 | 1 | 0 | NA | <0.2 $mg/m^3$ |
| | VOC | MR+ / MR Pro | 18 | 0 | NA | <0.1 ppm |

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

## Table 2: AreaRAE Air Monitoring Summary[1]
## November 25, 2014 07:00 – November 26, 2014 07:00

| Unit ID | Analyte | No. of Readings | No. of Detections | Avg. of Detections | Detection Range |
|---|---|---|---|---|---|
| Unit 01 | $H_2S$ | 5452 | 63 | 0.1 ppm | 0.1 - 0.2 ppm |
| | LEL | 5452 | 0 | NA | < 1 % |
| | $SO_2$ | 5452 | 4 | 0.1 ppm | 0.1 - 0.1 ppm |
| | VOC | 5452 | 64 | 0.2 ppm | 0.1 - 1.0 ppm |
| Unit 02 | $H_2S$ | 5298 | 1649 | 0.2 ppm | 0.1 - 0.7 ppm |
| | LEL | 5298 | 44 | 3.00% | 2.8 - 3.3 % |
| | $SO_2$ | 5298 | 2 | 0.1 ppm | 0.1 - 0.1 ppm |
| | VOC | 5298 | 89 | 0.1 ppm | 0.1 - 0.3 ppm |
| Unit 03 | $H_2S$ | 5367 | 0 | NA | < 1 ppm |
| | LEL | 5367 | 0 | NA | < 1 % |
| | $SO_2$ | 5367 | 0 | NA | < 0.1 ppm |
| | VOC | 5367 | 145 | 0.1 ppm | 0.1 - 0.1 ppm |
| Unit 04 | $H_2S$ | 5222 | 242 | 0.1 ppm | 0.1 - 0.3 ppm |
| | LEL | 5222 | 0 | NA | < 1 % |
| | $SO_2$ | 5222 | 0 | NA | < 0.1 ppm |

| | | | | | |
|---|---|---|---|---|---|
| | VOC | 5222 | 0 | NA | < 0.1 ppm |

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[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

## Table 3: Data-logged AM510 Particulate ($PM_{10}$) Monitoring Summary[1]
## November 25, 2014 07:00 – November 26, 2014 07:00

| Serial No. | Location | No. of Readings | No. of Detections | Avg. Detection | Detection Range |
|---|---|---|---|---|---|
| 10408088 | AR01 | 53 | 53 | 0.008 | 0.005 - 0.038 $mg/m^3$ |
| 10704074 | AR02 | 1151 | 740 | 0.005 | 0.001 - 0.103 $mg/m^3$ |
| 11005015 | AR03 | 1025 | 1025 | 0.012 | 0.004 - 0.394 $mg/m^3$ |
| 10408087 | AR04 | 1180 | 1180 | 0.019 | 0.001 - 0.42 $mg/m^3$ |

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*

# Appendix A

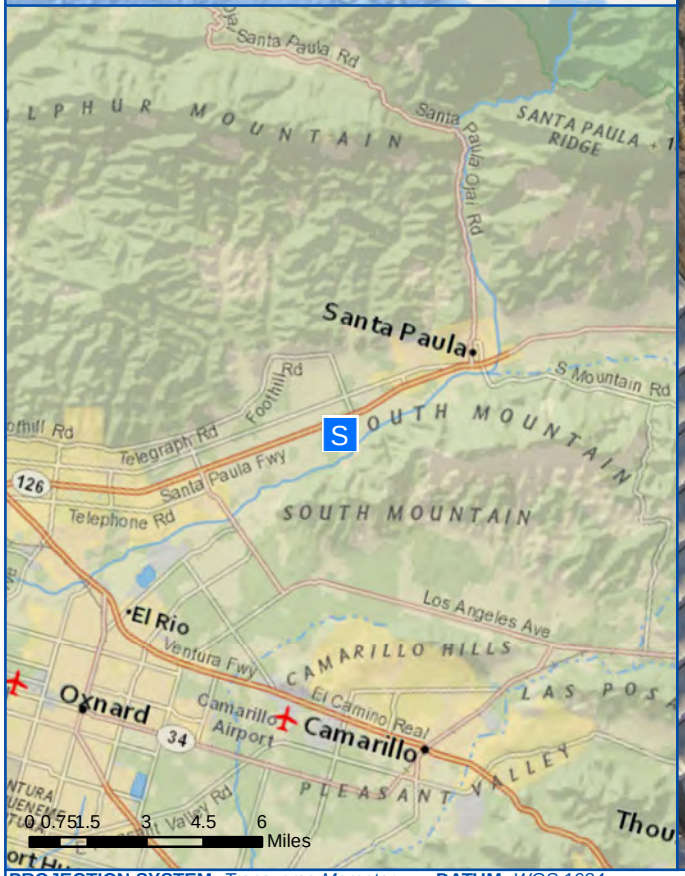
# Incident Maps:

# Real-time Air Monitoring Locations and Incident Site

# Site Location

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura



**PROJECTION SYSTEM:** *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/25/2014 9:42:14 AM*

# Aerial Overview - 11/25/2014

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura


**PROJECTION SYSTEM:** *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/26/2014 7:33:10 AM*

# Manually Logged Real-Time Air Monitoring Concentrations

VOC - Nov 25, 2014 07:00 to Nov 26, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura


PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/26/2014 7:45:30 AM*

# Manually Logged Real-Time Air Monitoring Concentrations

$H_2SO_4$ - Nov 25, 2014 07:00 to Nov 26, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura


PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/26/2014 7:43:13 AM*

# Manually Logged Real-Time Air Monitoring Concentrations

$SO_2$ - Nov 25, 2014 07:00 to Nov 26, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura


PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/26/2014 8:01:32 AM*

# Manually Logged Real-Time Air Monitoring Concentrations

$PM_{10}$ - Nov 25, 2014 07:00 to Nov 26, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura


**PROJECTION SYSTEM:** *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *11/26/2014 8:09:04 AM*

# Manually Logged Real-Time Air Monitoring Concentrations

Peroxides - Nov 25, 2014 07:00 to Nov 26, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura


PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/26/2014 8:00:48 AM*

# Manually Logged Real-Time Air Monitoring Concentrations

$O_2$ - Nov 25, 2014 07:00 to Nov 26, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura


PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/26/2014 7:57:30 AM*

# Manually Logged Real-Time Air Monitoring Concentrations

LEL - Nov 25, 2014 07:00 to Nov 26, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura


PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/26/2014 7:55:10 AM*

# Manually Logged Real-Time Air Monitoring Concentrations

## $H_2S$ - Nov 25, 2014 07:00 to Nov 26, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura


**PROJECTION SYSTEM:** *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *11/26/2014 7:59:45 AM*

# Manually Logged Real-Time Air Monitoring Concentrations

CO - Nov 25, 2014 07:00 to Nov 26, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura


PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/26/2014 12:29:18 PM*

# Manually Logged Real-Time Air Monitoring Concentrations

$Cl_2$ - Nov 25, 2014 07:00 to Nov 26, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura


**PROJECTION SYSTEM:** *UTM13N* **COORDINATE SYSTEM:** *WGS84*

**Print Date:** *11/26/2014 8:04:10 AM*

# Appendix B:

# AreaRAE Trend Graphs, AM510 Trend Graphs, and AreaRAE/AM510 Air Monitoring Location Map

# AreaRAE and AM510 Locations

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura


**PROJECTION SYSTEM:** *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/26/2014 11:37:30 AM*

## Patriot Environmental
## AreaRAE Trend Graphs
## 11/25/2014 07:00 - 11/26/2014 07:00


*- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format*
*- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"*

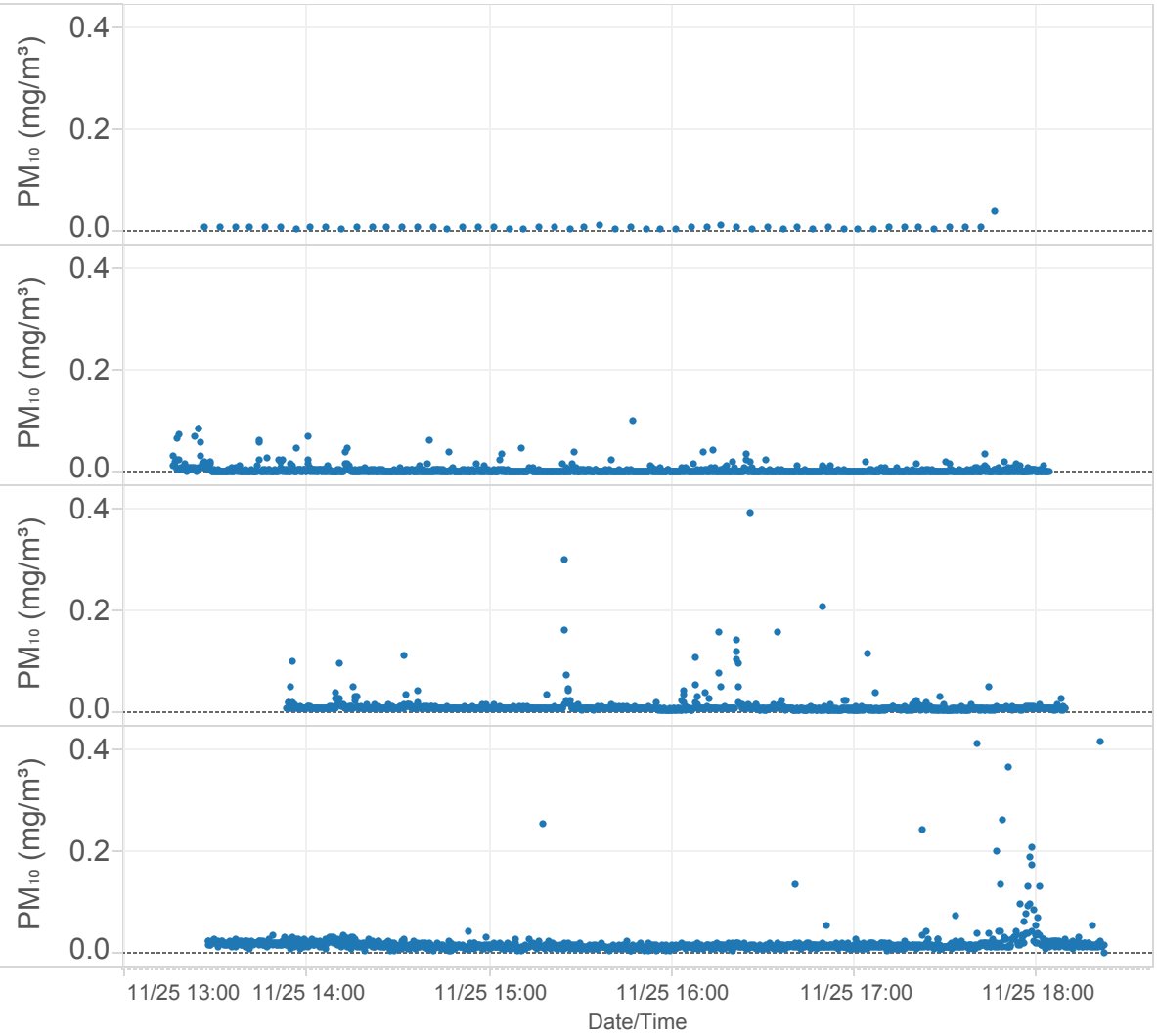
## Patriot Environmental
## AreaRAE Trend Graphs
## 11/25/2014 07:00 - 11/26/2014 07:00


*- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format*

*- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"*

Patriot Environmental
MISSION INCIDENT
Datalogged AM510 Summary
11/25/2014 07:00 - 11/26/2014 07:00

| Location | Serial No |
|---|---|
| AR01 | 10408088 |
| AR02 | 10704074 |
| AR03 | 11005015 |
| AR04 | 10408087 |




*- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format*